ISSN: 2349 - 4891
International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-Journal)

Effects and Combination of Strength, Endurance Training on the Development of Upper Extremity Muscular Strength among the University Level Male Basketball Players

Asha[1] & Dr.S.Suthakar[2]

[1]*Research Scholar, Karpagam University, Karpagam academy of Higher Education, Coimbatore, India.*
[2]*Research Guide, Head, Dept. of Physical Education, Karpagam University, Karpagam academy of Higher Education, Coimbatore, India.*

Received 25th September 2017, Accepted 5th November 2017

Abstract

The present investigation is to dissect the impact of society's move and resistance preparing with strength and endurance training and their combination on readiness and adaptability of University level male Basketball players. The subjects are chosen from Christ University, Jain University, CMR University and PES University students of Karnataka State. The subject's age runs from 18 to 21 years and the are partitioned into four gatherings specifically on Strength Training Group (STG), Endurance Training Group (ETG), Combination of strength and Endurance Training Group (CSETG) and Control Group (CG) each gathering comprising of 20 subjects. The chosen subjects are at first tried on the standard factors utilized as a part of this investigation and this is considered as the pre–test. In the wake of surveying of the pre–test, the subjects having a place with Strength Training Group (STG), Endurance Training Group (ETG) and Combination of Strength and Endurance Training Group (CSETG) are treated with Strength and Endurance Training Practices. To the extent the subjects in Control Group (CG) they are not given any training. It is reasoned that the 12 weeks of preparing hones demonstrated the huge enhancements in Upper Extremity Muscular Strength because of the treatment gatherings and there are no adjustments in control gathering.

Keywords: Upper Extremity Muscular Strength, (STG)-Strength Training Group, (ETG)- Endurance Training Group, (CSETG)-Combination of strength and Endurance Training Group (CG)-Control Group.

Introduction

Strength training is a type of physical exercise specialized in the use of resistance to induce muscular contraction which builds the strength, anaerobic endurance, and size of skeletal muscles. Muscular endurance is a muscle's ability to work continuously against resistance over a long period of time. To build muscular endurance, an athlete must train her muscles to overcome fatigue. Gains in muscular endurance has not got by increasing the weight lifted, but by increasing the amount of time a muscle spends contracting against the resistance. A muscular endurance training program should come after a maximum-strength building phase (high weights, low repetitions), because the greater a muscle's strength, the more force it can exert during muscular endurance training. Muscular endurance training should not be done to muscle failure.

Objectives of the study

To find out whether practice of Strength, Endurance and their combination training would significantly improve the Upper Extremity Muscular Strength of University level male basketball players.

Correspondence
Dr.S.Suthakar
E-mail: suthakar.ku@gmail.com, Ph. +9199650 65096

Hypothesis

It is hypothesised that the practice of Strength Training, Endurance Training and Combination of Strength and Endurance Training would significantly improve the Upper Extremity Muscular Strength of University Level male basketball players.

Methodology

The present study is to identify impact of Strength Training, Endurance Training and Combination of Strength and Endurance Training on Upper Extremity Muscular Strength of University level male basketball players. To accomplish reason for the investigation 80 subjects are chosen from Christ University, Jain University, CMR University and PES University students of Karnataka state. The subject's age runs from 18 to 21 years and the subjects are isolated into four gatherings. The Test groups are Experimental gathering – I (N=20) experiences Strength Training Group (STG), Experimental gathering – II (N=20) experiences Endurance Training Group (ETG), Experimental gathering – III (N=20) experiences Combination of strength and Endurance Training Group (CSETG) and lastly control gathering (N=20) do not do any Strength Training and Endurance Training is called as Control

Group (CG). The trial bunches took interest in regard for preparing the plan for the time of 12 weeks, three option days in seven days. The investigation parameters including Upper Extremity Muscular Strength likewise breaks down. The information is examined by utilizing "t" proportion to discover the mean contrast from pre test to post test. Investigation of co change and Scheffe's post hoc test.

Analysis of Data and Interpretation

Table 1
The tabulation values shows the mean losses / gains between pre and post test values of strength training group on upper extremity muscular strength of university level male basketball players

Components	Test	Mean	Std. Deviation	S.E.M	M.D	't' value
Upper Extremity Muscular Strength in Kilograms	Pre-Test	50.30	4.70	0.254	5.350	21.048*
	Post- Test	55.65	4.74			

*Significance at 0.05 levels (2.09)

Table 1 displays the results of 't' value of Upper Extremity Muscular Strength (21.048). The obtained tabulated t value is 2.09 which is statistically significant. It is found that the value is statistically significant at 0.05 level of confidence. It is observed that there is the mean significant improvement in Upper Extremity Muscular Strength (5.350p< 0.05).

Table 2
The tabulation values shows the mean losses / gains between pre and post test values of endurance training group on upper extremity muscular strength of university level male basketball players

Components	Test	Mean	Std. Deviation	S.E.M	M.D	't' value
Upper Extremity Muscular Strength in Kilograms	Pre-Test	50.45	4.36	0.198	2.550	12.856*
	Post- Test	53.00	4.23			

*Significance at 0.05 levels (2.09)

Table 2 displays the results of 't' value of Upper Extremity Muscular Strength (12.856). The obtained tabulated t value is 2.09 which is statistically significant. It is observed that there is the mean significant improvement in Upper Extremity Muscular Strength (2.550 p< 0.05).

Table 3
The tabulation values shows the mean losses / gains between pre and post test values of combination of strength and endurance training group on upper extremity muscular strength of university level male basketball players

Components	Test	Mean	Std. Deviation	S.E.M	M.D	't' value
Upper Extremity Muscular Strength in Kilograms	Pre-Test	50.20	4.36	0.348	10.000	28.742*
	Post- Test	60.20	4.36			

*Significance at 0.05 levels (2.09)

Table 3 displays the results of 't' value of Upper Extremity Muscular Strength (28.742). The obtained tabulated t value is 2.09 statistically significant. It is observed that there is the mean significant improvement in Upper Extremity Muscular Strength (10.000p< 0.05).

Table 4
The tabulation values shows the mean losses / gains between pre and post test values of control group on upper extremity muscular strength of university level male basketball players

Components	Test	Mean	Std. Deviation	S.E.M	M.D	't' value
Upper Extremity Muscular Strength in Kilograms	Pre-Test	50.65	5.66	0.082	0.150	1.831
	Post- Test	50.80	5.57			

*Significance at 0.05 levels (2.09)

Table 4 displays the results of 't' value of Upper Extremity Muscular Strength (1.831). The obtained tabulated t value is 2.09 which is statistically insignificant.

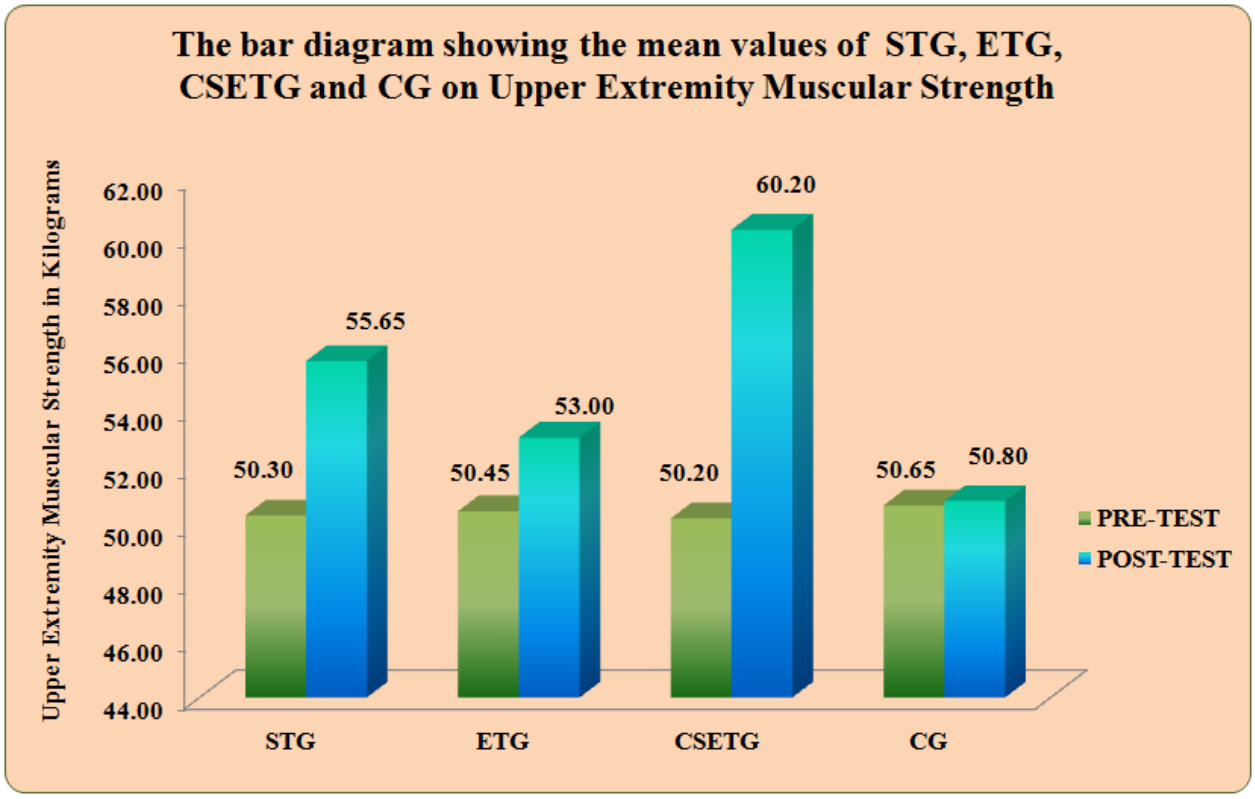

Figure I

Table 5
Analysis of variance on pre - test means values among the stg, etg, csetg and cg on upper extremity muscular strength of university level male basketball players

Components	Source Variance	Sum of Squares	DF	Mean Square	F	Sig.
Upper Extremity Muscular Strength in Kilograms	Between	2.300	3	0.767	0.033	0.992
	Within	1750.900	76	23.038		

*Significance at 0.05 levels (3.16)

Table 4 views the obtained 'F' value for the STG, ETG AND CG on Upper Extremity Muscular Strength (0.033). The obtained tabulated f value is 3.16 which has statistically not significant differences at the 95 % confidential level and the degrees of freedom (3, 76). It is found that it statistically shows insignificant difference. So the treatment is successful.

Table 6
Analysis of variance on post - test means values among the stg, etg, csetg and cg on upper extremity muscular strength of university level male basketball players

Components	Source Variance	Sum of Squares	DF	Mean Square	F	Sig.
Upper Extremity Muscular Strength in Kilograms	Between	981.44	3	327.146	14.48*	0.000
	Within	1716.95	76	22.591		

*Significance at 0.05 levels (3.16)

Table 6 views that the obtained 'F' value for the STG, ETG AND CG on Upper Extremity Muscular Strength (14.949). The obtained tabulated f value is 3.16 which has statistically not significant differences at the 95 % confidential level and the degrees of freedom (3, 76). It is found that it statistically shows insignificant difference. So the treatment is successful.

Table 7
Analysis of co-variance on pre and post test mean values among the stg, etg, csetg and cg on selected physiological and motor fitness components of university level male basketball players

Components	Source Variance	Sum of Squares	DF	Mean Square	F	Sig.
Upper Extremity Muscular Strength in Kilograms	Between	1069.360	3	356.453	311.13*	.000
	Within	85.925	75	1.146		

*Significance at 0.05 levels (3.16)

Table 7 views that the obtained 'F' value for the STG, ETG AND CG on Upper Extremity Muscular Strength (311.133). The obtained tabulated f value is 3.16 which has statistically significant differences at the 95 % confidential level and the degrees of freedom (3, 75). It is found that statistically shows significant difference.

Table 8
The scheffe's post hoc test for the differences between adjusted post test means of stg, etg, csetg and cg on upper extremity muscular strength

STG	ETG	CSETG	CG	Mean Differences	Confidence Interval Value
55.747	52.952	---	---	2.795	**0.954**
55.747	---	60.393	---	4.646	**0.954**
55.747	---	---	50.559	5.188	**0.954**
---	52.952	60.393	---	7.441	**0.954**
---	52.952	---	50.559	2.393	**0.954**
---	---	60.393	50.559	9.834	**0.954**

* Significant at 0.05 level of confidence

Table 8 shows the adjusted post hoc test mean values of STG group, ETG group, CSETG group and CG. The mean difference required for the confidential interval to be significant and the value is 0.954. In Comparing the STG group and ETG group, the mean difference between the two groups is 2.795. Hence ETG group shows better improvement on Upper Extremity Muscular Strength. In Comparing the STG group and CSETG group, the mean differences between the two groups is 4.646. Hence CSETG group shows better improvement on Upper Extremity Muscular Strength. In comparing the STG group and CG, the mean difference between the two groups is 5.188. Hence STG group were shows better improvement on Upper Extremity Muscular Strength. In Comparing the ETG group and CSETG group, the mean difference between the two groups is 7.441. Hence CSETG group shows better improvement on Upper Extremity Muscular Strength. In comparing ETG group and CG, the mean difference between the two groups is 2.393. Hence ETG group shows better improvement on Upper Extremity Muscular Strength. In comparing CSETG group and CG, the mean difference between the two groups is 9.834. Hence, CSETG group shows better improvement on Upper Extremity Muscular Strength. Finally CSETG group shows better improvement than the STG group, ETG group and CG on Upper Extremity Muscular Strength.

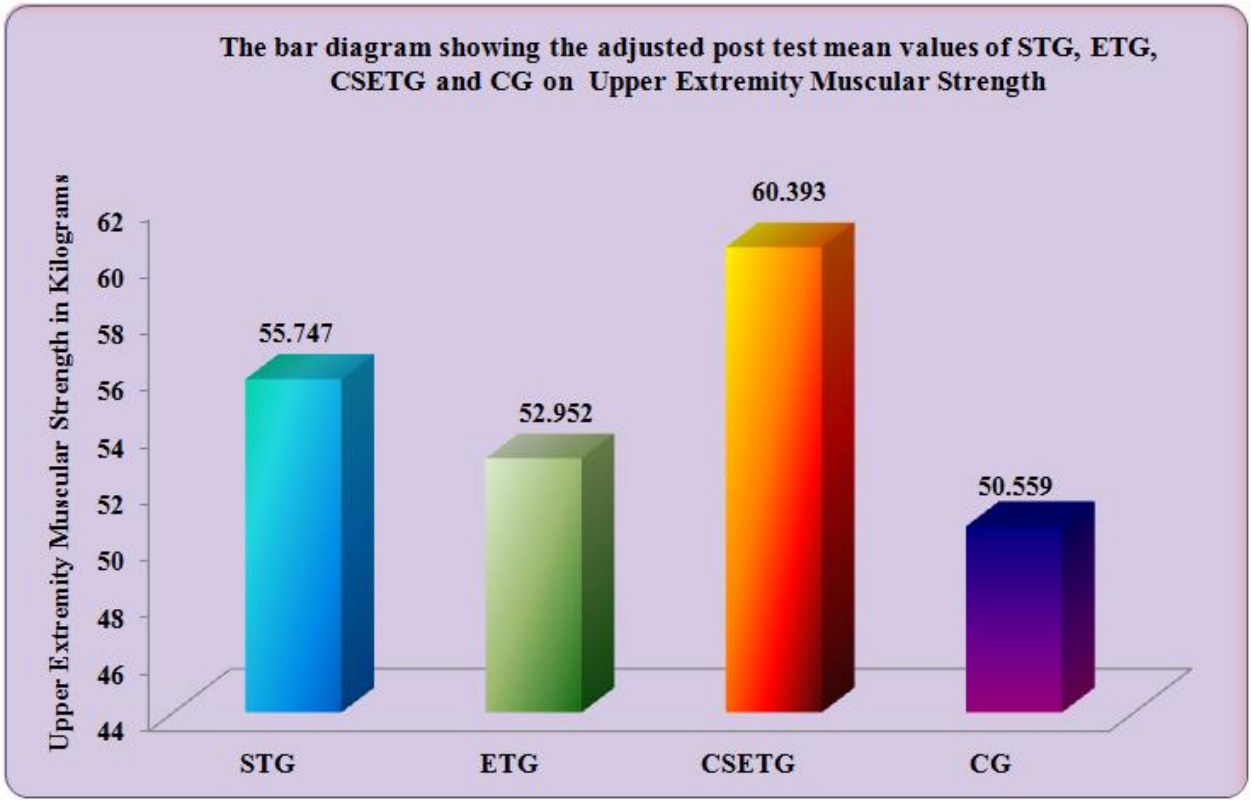

Figure II

Discussion on Present Study

This study confirms that there is improvement in Upper Extremity Muscular Strength among Effects of Strength Training, Endurance Training and Combination of Strength and Endurance Training of university level male basketball players.

Discussion of the Study

In analyzing the Upper Extremity Muscular Strength for three different training groups in Combination of Strength and Endurance Training, over the period of twelve weeks of training, the obtained results favor that the University level male basketball players who practiced with the Strength Training on Upper Extremity Muscular Strength have good result. The obtained results display similar effect among the other two training modules after the completion of 12 weeks of training period. The results on Upper Extremity Muscular Strength are discussed below.

Upper Extremity Muscular Strength

Strength Training, Endurance Training and Combination of Strength and Endurance Training significantly show improvement on the Upper Extremity Muscular Strength from pre test to post test. The present study demonstrates that an increase in Upper Extremity Muscular Strength of 10.64%, 5.05%, 19.92% and 0.30% is estimated with 1Rm Bench press test for the Strength Training, Endurance Training, Combination of Strength and Endurance Training and control group respectively. The Combination of Strength and Endurance Training significantly shows improvement in the Upper Extremity Muscular Strength by 19.92% better than the STG 10.64%, ETG 5.05% and control group 0.30%. The Strength Training shows improvement in the Upper Extremity Muscular Strength by 10.64% better than the ETG 5.05% and control group 0.30%. The Endurance Training shows improvement in the Upper Extremity Muscular Strength by 5.05% better than the control group 0.30%.

Result of the Study

1. The present study shows that the Strength Training significantly improves Upper Extremity Muscular Strength of University level male basketball players.
2. The present study shows the Endurance Training significantly improves Upper Extremity Muscular Strength of University level male basketball players.
3. The present study shows that the results due to Combination of Strength and Endurance Training significantly improves Upper Extremity Muscular Strength of University level male basketball players.
4. The present study shows that the Combination of Strength and Endurance Training significantly improves Upper Extremity Muscular Strength better than the Strength Training, Endurance Training and control group of University level male basketball players.
5. The present study shows that the Strength Training significantly improves Upper Extremity Muscular Strength better than the

Endurance Training and control group of University level male basketball players.

6. The present study shows that the Endurance Training significantly improves Upper Extremity Muscular Strength better than the control group of University level male basketball players.

Conclusion

1. It is concluded that Strength Training significantly improves Upper Extremity Muscular Strength of University level male basketball players.
2. It is concluded that Endurance Training significantly improves Upper Extremity Muscular Strength of University level male basketball players.
3. It is concluded that Combination of Strength and Endurance Training significantly improves Upper Extremity Muscular Strength of University level male basketball players.
4. It is concluded that Combination of Strength and Endurance Training significantly improves Upper Extremity Muscular Strength better than the Strength Training, Endurance Training and control group of University level male basketball players.
5. It is concluded that Strength Training significantly improves Upper Extremity Muscular Strength better than the Endurance Training and control group of University level male basketball players.
6. It is concluded that Endurance Training significantly improves Upper Extremity Muscular Strength better than the control group of University level male basketball players.

Reference

1. Semler, C., Ch., 2011. Effect of Plyometric Training and Squats on the Vertical Jump Performance, 1(2): 42-46. Untrained Females, in Health and Sport Science 15. Kotzamanidis, C., et al., 2005. The effect of a The University of Memphis.
2. Ratamess, N.A., et al., 2009. Progression models in resistance training for healthy adults. Medicine and Science in Sports and Exercise,
3. Gaeini, A.A.R.H., 2004. Text book, Physical Fitness. 2 Edition ed. Tehran: Samt Published,
4. James, G.H., 1993. The Biomechanics of Sports 17. Perez-Gomez, J.P.G.J., et al., 2008. Effects of weight Techniques. 4 Edition ed. 1993, Cliffs New Jersey: Prenzic _ Hall, Inc, Simon & Shuster Company Engle Wood, pp: 7632
5. Perez-Gomez, J.P.G.J., et al., 2008. Effects of weight lifting training combined with plyometric exercises on physical fitness, body composition and knee Extension velocity during kicking in football Applied Physiology, Nutrition and Metabolism, 33(3): 501-510.
6. Polhemus, R.E., et al., The Effect of Plyometric increase of vertical jumps of participants of the combined Training with Ankle and Vest Weights on Conventional Weight Training Programs for Men. Track & Field Q. Rev, 80(4): 59-61.
7. Tabatabaee, H., 1992. The Effect of Exercise Plyometric on Vertical jump of Basketball Players. 1992, University of Azad Islamic of Iran, Center unit Dissertation of AM
8. Dr.S.Suthakar k.m.Ashok kumar, R.Ashok kumar "An Effective Approach through Strength, Endurance and Skill Training Program Combinations on Flexibility and Dribbling of Male Basketball Players"., International Journal of Innovative Research and development (2016).
9. Bale, P., & Scholes, S. (1986). Lateral dominance and basketball performance. Journal of Human Movement Studies, 12, 145-151.
10. Coleman, E., Kreuzer, P., Friedrich, D. W., & Juvenal, J. P. (1972). Aerobic And Anaerobic Responses Of Male College Freshmen During A Season Of Basketball
11. Dr.S.Suthakar k.m.Ashok kumar, R.Ashok kumar "An Effective Approach through Strength, Endurance and Skill Training Program Combinations on Muscular Strength and Endurance and Explosive Power of Male Basketball Players"., International Journal of Innovative Research and development (2016).
12. S.Suthakar., and A. Pushparajan. "Effects of Silambam and Karate with Yogic Training oAgility and Arm Explosive Power of Collegiate Male Students." International Journal of Innovative Research and Development (2014).
13. Dr S Suthakar, Dr Sundar Raj Urs DP Shivakumar, 2016, Effect of Selected Yogic Exercises on Cardiovascular Endurance and Lung Capacity of Secondary School Children, IJESC, 6, 6 PP. 7286-7289.
14. Dr S Suthakar, Dr Sundar Raj Urs DP Shivakumar, 2016, Effect of selected yogic exercises on selected physiological variable of secondary school children., International Journal of Physical Education, Sports and Health, 4-114.
15. S.Suthakar and Dr.A.Pushparajan, Effects of Silambam and Karate with Yogic Training on Agility and Arm Explosive Power of Collegiate Male Students., International Journal of Innovative Research and Development|| ISSN 2278–0211
16. R.Ashok kumar Dr.S.Suthakar, K.M.Ashokkumar, 2016. An Effective Approach through Strength, Endurance and Skill Training Program Combinations on

Muscular Strength and Endurance and Explosive Power of Male Basketball Players., International Journal of Innovative Research and Development., 5,4,218-220.

17. R. Ashok Kumar K. Babu , S. Suthakar, 2016. Effects of Volleyball Specific Resistance Training and Skill Training Packages on the Development of Leg Explosive Power and Speed on the Higher Secondary Level School Boys,2016/3, international journal of innovative research and development, 5, 4,231-235.
18. Dr.S.Suthakar Venkata chalapathi G, 2016. Analysis of physical growth on specific fitness training among tribal and non-tribal school boys, 2016/10/27, International Journal of Physical Education, Sports and Health3,6, 137-142.